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Jan.

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INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION
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Ogden, Utah

January 1961

DOUGLAS-FIR BEETLE INFESTATIONS IN THE
NORTHERN ROCKY MOUNTAIN REGION
IN 1960

Archibald Tunnock, Jr., Entomologist

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Prepared by the
Forest Insect Laboratory
Missoula, Montana

DOUGLAS-FIR BEETLE INFESTATIONS IN THE
NORTHERN ROCKY MOUNTAIN REGION
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HISTORY

The causes of Douglas-fir beetle (Dendroctonus pseudotsugae Hopk.) outbreaks in the northern Rocky Mountain region are not easily explained. Outbreaks may develop in Douglas-fir stands that have been subjected to blowdowns, fire, or continued defoliation by insects. Also, they frequently develop in uninjured stands.

Epidemic outbreaks of the beetle in this region have occurred at about 9- or 10-year intervals. These epidemics usually have lasted from 3 to 4 years, then subsided. Heavy timber losses were sustained on and adjacent to eight national forests in northern Idaho and western Montana from 1950 to 1952. During this period, the Douglas-fir beetle infested 964,000 acres in the Bitterroot, Clearwater, Coeur d'Alene, Kaniksu, Kootenai, Lolo, Nezperce, and St. Joe National Forests, and destroyed 333 million board feet of sawtimber. In 1952 the beetles killed two and a half times as much sawtimber by volume than was cut in 1951 on these eight Forests.^{1/}

Douglas-fir beetle infestations have reached epidemic status again in the northern Rocky Mountain region. New infestations have been reported with increasing frequency since 1958.

LIFE HISTORY

The life history of the Douglas-fir beetle is described in detail by Bedard.^{2/} It is important to remember that the beetle has one generation per year, and that there are two periods each year when it attacks and kills trees; from April to mid-June, and again during late summer. The spring attacks are the most important because they kill more trees than do those of the late summer.

^{1/} Task Force Representing - Timber Industry, Bureau of Entomology and Plant Quarantine, and U.S. Forest Service. 1953. Douglas-fir bark beetle infestation and proposed plan aimed at its control, north Idaho and western Montana. Forest Service, U.S. Dept. Agr., Missoula, Montana. Progress Report, 59 pp. illus. (Processed)

^{2/} Bedard, W. D. 1950. The Douglas-fir beetle. U.S. Dept. Agr. Circ. 817, 10 pp., illus.

INFESTATIONS IN THE NORTHERN ROCKY MOUNTAIN REGION

Knowledge of the extent of Douglas-fir beetle infestations in the northern Rockies during 1960 was obtained from aerial surveys and from reports submitted by field personnel of various forestry agencies. Infestations were detected by spotting groups of trees with the reddish foliage characteristic of those killed by the beetle. Trees thus observed were killed mostly in 1959. Trees killed in 1960 will not show detectable foliage discoloration until the 1960-61 winter months or until the spring of 1961. Therefore, the amount of current tree mortality could not be determined alone by detection and surveillance methods used in 1960.

Several national forests in the region that were known to be heavily infested by the beetle were surveyed more intensively from the air than others: the Lolo, Kootenai, and Gallatin National Forests. The western part of the Nezperce National Forest was surveyed from the ground. These intensive surveys made it possible to locate the scattered infestations more accurately and to measure their extent. The extent of an area containing scattered infestations was determined by enclosing them within an arbitrary boundary after they had been located on a forest map. The approximate gross acreage of the area enclosed by the line was then calculated.

Large areas of timbered land in the northern Rocky Mountain region were found to contain infestations of Douglas-fir beetle in 1959. The Lolo National Forest had severe epidemics, mostly in the form of widely scattered infestations found throughout the Garnet Mountain Range, and in Douglas-fir forests south of Thompson Lakes to Plains, Montana.

Similar infestations occurred over an area of about 96,000 acres in the Kootenai National Forest, Montana, with the areas north of the Thompson Lakes and in the Wolf Creek Drainage containing the greatest number.

Douglas-fir beetle infestations were widely scattered over more than 70,000 acres in the Nezperce National Forest in Idaho. A few small groups of infested trees were obvious in almost every drainage on the Salmon River and Slate Creek Ranger Districts.

Stands of Douglas-fir in the Gallatin National Forest, Montana were heavily infested south of Bozeman, from the South Fork of Spanish Creek east to Jackson Creek. Fir stands in this area have been repeatedly defoliated by the spruce budworm in recent years.

The Beaverhead, Bitterroot, Flathead, Helena, and Lewis and Clark National Forests in Montana and the Coeur d'Alene and Kaniksu National Forests in Idaho also contained scattered groups of trees killed by the Douglas-fir beetle. Similar infestation conditions also prevailed within 4,000 acres in the northern part of Yellowstone National Park near the Montana-Wyoming state line.

Timberland owners and managers can minimize stand depletion in certain accessible stands by prompt salvage of infested trees before the beetles emerge from them in the spring. This may be accomplished in some instances by logging infested trees where they occur in concentrations and where they are accessible.

Douglas-fir trees that contain current beetle brood are very difficult to detect. Several external characteristics are useful for recognizing current attacks. Boring dust is the best indicator. New dust is light, fluffly, and somewhat stringy, and yellowish-red in color. It is found on the bark, near the basal roots, and on leaves of plants growing close to the tree trunks. Old dust is a darker red, and is packed tightly into the bark crevices of trees abandoned by the beetles.

Foliage color of infested trees varies a great deal because of the extended attack period (May through most of September). During a normal year a few trees will start to fade in the fall. The foliage begins to turn yellow on most trees by spring and a few will have some red needles. Needles on infested trees start to drop late during the year following attack.



AREAS CONTAINING DOUGLAS-FIR BEETLE
INFESTATIONS IN 1960

- NUMEROUS INFESTATIONS
- — ONE OR SEVERAL INFESTATIONS

NATIONAL FORESTS, PARKS, AND
INDIAN RESERVATIONS
IN THE NORTHERN PART OF THE TERRITORY
SERVED BY THE
INTERMOUNTAIN FOREST AND RANGE
EXPERIMENT STATION
FOREST SERVICE, U.S. DEPARTMENT OF AGRICULTURE
OGDEN, UTAH

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